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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/678,489	10/03/2003	Vahid Goudarzi	CE11821JME	1459

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EXAMINER	
VU, DAVID	
ART UNIT	**PAPER NUMBER**
2818	

DATE MAILED: 08/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/678,489	**Applicant(s)** GOUDARZI ET AL.	
	Examiner DAVID VU	**Art Unit** 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 31 May 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 7-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 7-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 03 October 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.914

1. A request for continued examination under 37 CFR 1.114, including the, fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 31, 2006 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 8, 15-17 and 20 are rejected under 35 U. S. C. 102(b) as being anticipated by Degani et al. (US Pat. 5,346,118, hereinafter Degani).

Regarding claims 7-9, 16, 17 and 20, Degani discloses in figs. 2-5 a module, comprising: a first substrate 11 comprised of a first material (col. 2, lines 59-61); at least a second substrate 10 comprised of at least a second material; solder of a first composition 12 residing between the first substrate 11 and at least the second substrate 10 on a first area; and solder of at least a second composition 12 residing between the first substrate 11 and at least the second substrate 10 on a separate area from the first area such that the solder of the first composition and the solder of second composition (next to the first solder) are vertically separated; wherein the solder of the first composition 12 and the solder of the second composition 12 are in a collapsed state (col. 3, lines 11-15 and figs. 4-5).

Regarding claim 15, Degani discloses in fig 1, 4 and col. 2, line 59-col. 3, line 7 the module is a ball grid array package.

3. Claims 7-10, 12 and 14-20 are rejected under 35 U. S. C. 102(b) as being anticipated by Wood et al. (US Pat. 6,150,717, hereinafter Wood).

Regarding claims 7, 8, 10, 12, 14, 16, 17 and 20, Wood discloses in figs. 11-11E a module 92, comprising: a first substrate 10M comprised of a first material (DDC/PCB); at least a second substrate 94 comprised of at least a second material (ceramic); solder of a first composition 12M/96 residing between the first substrate 10M and the second substrate 94 on a first area; and solder of a second composition 12M/96 residing between the first substrate 10M and at least the second substrate 94 on a separate area from the first area (col. 8, line 63-col. 9, line 22) such that the solder of the first composition and the solder of second composition (next to the first solder) are vertically separated (fig. 11B); wherein the solder of the first composition 12/18 and the solder of the second composition 12/18 are in a collapsed state (figs. 11A-11C).

Regarding claim 9, Wood discloses the first substrate is comprised of a printed circuit board material having a coefficient of thermal expansion (col. 2, lines 48-51) and the second substrate is a ceramic material having a different coefficient of thermal expansion (col. 9, lines 23-24).

Regarding claim 10, Wood discloses the selectively applied solder of the first composition 12M has a higher melting point solder than the selectively applied solder of the second composition 96 (col. 9, lines 7-22).

Regarding claim 15, Wood discloses the module is a ball grid array package (col. 2, lines 42-44).

Regarding claims 18 and 19, Wood discloses the step of selectively applied solder of the first composition 12M is applied to a substantially centrally located area on at least one among the first substrate and the second substrate and the selectively applied solder of at least the second composition 96 is applied to a substantially peripherally located area about the centrally located area, wherein the solder of the first composition 12M has a higher melting point than the second composition 96 (col. 9, lines 7-22).

4. Claims 7-10, 12 and 14-20 are rejected under 35 U. S. C. 102(b) as being anticipated by Schwiebert et al. (US Pat. 5,539,153, hereinafter Schwiebert).

Schwiebert discloses in figs. 6A-6C a module comprising: a first substrate comprised of a first material; a second substrate comprised of a second material; solder of a first composition 610 residing between the first substrate and at least the second substrate; and solder of a second composition 612 residing between the first substrate and at least the second substrate (col. 11, lines 42-67); wherein the solder 610 (peripherally area) having a first composition and the solder 612 (centrally area) having a different second composition (col. 11, lines 46-47). Note that the process limitation "wherein the solder of the first composition and the solder of the second composition are in a collapsed state" after the reflow process does not structurally distinguish the claimed invention over Schwiebert.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 11 and 13 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Schwiebert et al. (US Pat. 5,539,153) in view of Degani (US Pat. 5,346,118).

Schwiebert discloses a device and a package include solder bump of first and second composition but fails to disclose the higher melting point solder 610 is comprised of approximately 95.5%Sn, 3.8%Ag and 0.7%Cu and the lower melting solder 612 of the second composition is comprised of approximately 57%Bi, 42%Sn, and 1 %Ag. However, Degani teaches the composition of the solder alloy is the choice of an appropriate solder alloy (col. 6, lines 15-43). It would have been obvious to one with ordinary skill in the art at the time of the invention to form a solder bump as taught by Degani in the module of Schwiebert. The motivation is to provided the benefit/advantage of the formation of reliable solder joints (See Abstract).

Response to Arguments

6. Applicant's arguments filed 05/31/06 have been fully considered but they are not persuasive.

7. Applicant argues that Degani and Wood's devices are not anticipatory as it does not address the issue of different CTE between various substrate. However, this argument is not persuasive. First, the argument imports limitations from the specification into the claim which importation is expressly prohibited. *In re Morris*, (127 F.3d 1048 (Fed. Cir. 1997). Alternatively, the argument is incorporating the limitations of claim 9 into claim 7. However, the canons of claim construction require that claim 9 be interpreted as expressly absent those limitations. Moreover, Wood also discloses the first substrate is a printed circuit board material having a

coefficient of thermal expansion (col. 2, lines 48-51) and the second substrate is a ceramic material having a different coefficient of thermal expansion (col. 9, lines 23-24). As such, applicant's argument that Degani and Wood's devices fails to anticipate claim 7 is not persuasive.

8. Applicant argues that as depicted in figs. 6A-6C of Schwiebert, “during reflow, the stand-off bump 610 will not melt and collapse….”. As such, the limitation “collapse” does not further define the structure as instantly claimed, nor serve to distinguish over Schwiebert. Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw make clear.

Moreover, as shown in fig. 4 of the Specification, the method 40 can include the step 42 of selectively applying solder of a first composition between a first substrate and a second substrate and the step 46 of selectively applying solder of at least a second composition between the first substrate and the second substrate. Then, the method can include the step 52 of reflowing the solder of the first composition and the second composition. Note that the process of reflowing the solder of the first composition and the second composition does not structurally distinguish the claimed invention over Degani, Wood and Schwiebert.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith S can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAVID VU
PRIMARY EXAMINER